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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/707,465 | 12/16/2003 | Mark Alan Rosenzweig | 13DV-13863 | 1464 |
| 30952 | 7590 | 12/16/2005 | EXAMINER | |
| HARTMAN AND HARTMAN, P.C. 552 EAST 700 NORTH VAIPARAISO, IN 46383 | | | CULBERT, ROBERTS P | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 1763 | |

DATE MAILED: 12/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/707,465 | ROSENZWEIG ET AL. | |
| | Examiner | Art Unit | |
| | Roberts Culbert | 1763 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 16 February 2003.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-20 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

| | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>12/16/03</u> . | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-10 and 14-20 is rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art (APA) in view of U.S. Patent 6,475,289 to Schilbe et al, or alternatively, in view of U.S. Patent 6,265,022 to Fernihough et al.

Regarding Claims 1, 5-7, 15-16, and 18, the admitted prior art (APA) recites a process comprising the steps of: forming an aluminized surface within an internal cavity of a gas turbine engine component by injecting a slurry into the internal cavity and then heating the slurry and the component, the slurry comprising metallic particles of an aluminum source, oxide particles, and an activator that are mixed and suspended in a liquid vehicle, the activator vaporizing during heating to react with the metallic particles and form a volatile aluminum halide, wherein some of the metallic particles oxidize to form oxidized particles that sinter to the aluminized surface. The admitted prior art teaches that it is known to then

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remove the oxidized particles by mechanical cleaning such as high-pressure water jets, or by employing caustic compounds at high temperatures and pressures (e.g. performed in an autoclave)

The admitted prior art (APA) does not teach contacting the aluminized surface with an aqueous caustic hydroxide solution until the adherent particles are removed from the surface.

However, Schilbe et al. teach that a suitable caustic compound for removal of oxidized particles from the internal cavities of turbine components is an aqueous hydroxide solution (balance water) such as potassium hydroxide (KOH). (See Col. 3, Lines 37-44) Note that de-ionized water is an obvious expedient for the water in forming the solution as recognized by one skilled in the chemical arts.

It would have been obvious to one of ordinary skill in the art at the time of invention to use the caustics (KOH) well known in the art for removal of adherent oxides from the internal surfaces of turbine components.

Alternatively, Fernihough et al. teaches that (KOH) is suitable caustic compound for removal of ceramic or metallic particles from internal surfaces of a turbine component after an aluminizing process. (Col. 6, Lines 28-30)

It would have been obvious to one of ordinary skill in the art at the time of invention to use (KOH) after an aluminizing process in order to remove residual metal oxides (ceramic) from the internal surfaces of turbine components. Note that application of potassium hydroxide as recited in Fernihough et al. in the form of a solution would have presented itself as an obvious expedient to one skilled in the cleaning art, and thus does not require inventive or creative effort.

Regarding Claims 2-4, 8-10, 15, 17 and 19, the cited dependent claims differ from applicant's admitted prior art (APA) in view of U.S. Patent 6,475,289 to Schilbe et al. only by specifying various concentrations temperatures and process conditions. However, as one of ordinary skill in the chemical arts recognizes, such process conditions may vary depending on the amount of adherent metal oxides to be removed from the component. A person having ordinary skill in the art at the time of the claimed

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invention would have found it obvious to modify the prior art by using different processing parameters because same were known to be cause effective variables and routine experimentation would have been expected to optimize them for the particular amount of metal oxides to be removed. *In re Boesch*, 205 USPQ 215 (CCPA 1980).

Generally, changes in temperature, concentrations or other process conditions of an old process do not impart patentability unless the recited changes are critical, i.e., they produce a new and unexpected result.

Regarding Claims 14 and 20, the APA, Fernihough et al. and Schilbe et al. are directed at cleaning cooling passages in a turbine blade and the like.

Claims 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art (APA) in view of U.S. Patent 6,475,289 to Schilbe et al. or alternatively, in view of U.S. Patent 6,265,022 to Fernihough et al. and in further view of U.S. Patent 5,707,453 to Sherman et al.

Regarding Claims 11-13, the (APA) in view of Schilbe et al. does not teach using ultrasonic agitation. However, it is old in the turbine component cleaning art to use ultrasonic energy to remove adherent oxide particles and the like from internal passages. For example, Sherman et al. teaches using 20 kHz with a mild alkali solution. (Col. 4, Lines 38-43)

It would have been obvious to one of ordinary skill in the art at the time of invention to use ultrasonic agitation to increase removal efficiency from the internal passages of turbine components as taught by Sherman et al.

Claims 1-11 and 13-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art (APA) in view of U.S. Patent Application Publication 2005/0035086 to Chen et al.

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Regarding Claims 1, 5-7, 14, 18 and 20, the admitted prior art (APA) recites a process comprising the steps of: forming an aluminized surface within an internal cavity of a gas turbine engine component by injecting a slurry into the internal cavity and then heating the slurry and the component, the slurry comprising metallic particles of an aluminum source, oxide particles, and an activator that are mixed and suspended in a liquid vehicle, the activator vaporizing during heating to react with the metallic particles and form a volatile aluminum halide, wherein some of the metallic particles oxidize to form oxidized particles that sinter to the aluminized surface. The admitted prior art teaches that it is known to then remove the oxidized particles by mechanical cleaning such as high-pressure water jets, or by employing caustic compounds at high temperatures and pressures (e.g. performed in an autoclave)

The admitted prior art (APA) does not teach contacting the aluminized surface with an aqueous caustic hydroxide solution until the adherent particles are removed from the surface.

Chen et al. teaches using a KOH solution having a temperature of 60-100°C a concentration of 10-50% and a cleaning time of 20 min to 4 hours, (Paragraphs 37-38) and using ultrasonic agitation. (Paragraphs 39 and 34) Note that the step of rinsing with water is notoriously old and well known in the cleaning art for removing caustics and the like from the surface.

It would have been obvious to one of ordinary skill in the art at the time of invention to use the caustic solution of Chen et al. since Chen et al. teaches that the solution is well suited for removal of metal oxides and the like from the internal surfaces of turbine components.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art (APA) in view of U.S. Patent Application Publication 2005/0035086 to Chen et al. and in further view of U.S. Patent 5,707,453 to Sherman et al.

Regarding Claims 12, Chen et al. teach using ultrasonic agitation but does not expressly teach power or frequency. However, Sherman et al. teaches up to 400 watts/in² using 20 kHz with a mild alkali solution. (Col. 4, Lines 38-43)

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It would have been obvious to one of ordinary skill in the art at the time of invention to use ultrasonic agitation using the ranges of Sherman et al. to increase the efficiency of the cleaning solution in the well-known manner.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Roberts Culbert whose telephone number is (571) 272-1433. The examiner can normally be reached on Monday-Friday (8:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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R. Culbert
Examiner
Art Unit 1763

p-l
Parviz Hassanzadeh
Supervisory Patent Examiner
Art Unit 1763